

## **Investigating the Association between Organizational Differences and the Implementation of ISO 9001:2000**

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### **Abstract**

This paper reports on the results of a study investigating the issue of whether aspects relating to the implementation of ISO 9001:2000 quality management standard differ according to organization size or sector type. Data required for this study were collected from 42 randomly selected organizations of different size and sector type operating in the Sultanate of Oman. The results show that there is no strong evidence to suggest that the motives for implementation, the process and cost of achieving certification, the perceived benefits, and the shortcomings differ significantly according to organization size or sector type. The main outcome of this study is that the issue of organization size or sector type should not be a factor in deciding upon certification.

### **Keywords**

Quality management, ISO 9001:2000 certification, organization size, sector type

### **1. Introduction**

Achieving, enhancing, and sustaining competitiveness in today's competitive environment is dependent on providing high quality and low cost products and services in the least possible time. Because of this, organizations pursue a number of management tools and philosophies including quality management systems. These systems play an important role in raising the levels of quality, safety, efficiency, reliability, productivity, and work satisfaction, as well as reducing cost. According to Goetsch and Davis [1], "a quality management system consists of all the organization's policies, procedures, plans, resources, processes, and delineation of responsibility and authority, all deliberately aimed at achieving product or service quality levels consistent with customer satisfaction and the organization's objectives. When these policies, procedures, plans, etc. are taken together, they define how the organization works, and how quality is managed." The ISO 9000 standard is perhaps the most well known quality management system. It was developed by the International Organization for Standardization in 1987 and was adopted in 1989 by the European Committee for Standardization as the quality management system standard for the European Community, which is one of the pillars of the European Union.

Several studies have been carried out investigating aspects relating to the implementation of the 2000 or 1994 versions of ISO 9000 in organizations operating in different countries. These studies addressed several aspects, including the motives for seeking certification, the process and cost of achieving certification, and the perceived benefits and shortcomings of the Standard. However, only a small number of studies have investigated the association between organization size and sector type and aspects of ISO 9000 implementation. From these studies, a number of common limitations can be identified including:

- Few aspects of ISO 9000 being addressed.
- Contradicting conclusions in the literature concerning the association between aspects of ISO 9000 implementation and organization size or sector type. For instance, Taylor [2] has reported that there is no evidence to suggest that any differences in organizations' reasons for seeking ISO 9000 certification are associated with organization size. However, on the other hand, Magd and Curry [3] and Magd [4] have reported

that large manufacturing organizations are significantly more likely to seek certification to improve the quality system than medium size organizations are.

It should be noted that for simplicity, ISO 9001:2000 quality management standard shall be referred to as ISO 9000 in the remaining part of this paper.

## 2. Objective and Hypothesis Development

Taking into account the highlighted limitations of previous works, the main objective of this research is to address the issues of organization size and sector type in regards to the implementation of ISO 9000 by providing answers to the following questions:

- Do the reasons for seeking ISO 9000 certification differ significantly according to organization size or sector type?
- Do the key factors for the successful implementation of ISO 9000 differ significantly according to organization size or sector type?
- Does the cost of implementing ISO 9000 versus the benefits gained from certification differ significantly according to organization size or sector type?
- Are the perceived benefits from implementing ISO 9000 significantly different according to organization size or sector type?
- Do the shortcomings of ISO 9000 implementation differ significantly according to organization size or sector type?
- Does the level of satisfaction with ISO 9000 differ significantly according to organization size or sector type?

To address the above research questions, 12 null hypotheses were developed as follows:

- H1: Reasons for seeking ISO 9000 certification do not differ significantly according to organization size
- H2: Reasons for seeking ISO 9000 certification do not differ significantly according to sector type
- H3: The contribution of factors to the successful implementation of ISO 9000 does not differ significantly according to organization size
- H4: The contribution of factors to the successful implementation of ISO 9000 does not differ significantly according to sector type
- H5: The cost of implementing ISO 9000 versus benefits gained from certification does not differ significantly according to organization size
- H6: The cost of implementing ISO 9000 versus benefits gained from certification does not differ significantly according to sector type
- H7: The perceived benefits from implementing ISO 9000 do not differ significantly according to organization size
- H8: The perceived benefits from implementing ISO 9000 do not differ significantly according to sector type
- H9: The shortcomings of implementing ISO 9000 do not differ significantly according to organization size
- H10: The shortcomings of implementing ISO 9000 do not differ significantly according to sector type
- H11: The level of satisfaction with ISO 9000 does not differ significantly according to organization size
- H12: The level of satisfaction with ISO 9000 does not differ significantly according to sector type

## 3. Methodology

For data collection, a questionnaire with closed type question forms was prepared. The first part of the questionnaire contained questions relating to the organization profile including the number of employees, scope of work, ownership type, and others. The second part of the questionnaire was designed to address the aspects being investigated in this study which include reasons for seeking ISO 9000 implementation (10 reasons); factors contributing to the successful implementation of ISO 9000 (11 factors); benefits versus cost; perceived benefits (27 benefits); shortcomings (7 statements); and satisfaction. The refined questionnaire was then randomly distributed to quality managers at 120 certified organizations in the Sultanate of Oman. A total of 42 respondents completed the form, representing a 35 % response rate. 10% of responses were received from small size organizations, 51% of responses were received from medium size organizations, and 39% of responses were received from large organizations. It is worth noting that organization size can be classified in different ways. However, the number of

employees is the most widely used classification. In this study, an organization is considered small if the number of employees is less than 50, medium if it has between 50 to 250 employees, and large if the number of employees is more than 250. This classification is used in other studies, e.g. Magd [4]. The sample distribution by industry sector is as follows: 43% of responses were received from manufacturing organizations, 24% of responses were received from engineering service organizations, 19% of responses were received from general services organizations, and 12% of responses were received from construction organizations. The majority of participant organizations (71%) are local private, 22% joint type venture, 5% international private, and 2% public/ private organization.

To analyze the collected data two nonparametric statistical tools were used: the median and the Kruskal-Wallis test. The median was used for ranking purposes, whereas the Kruskal-Wallis test was used for testing the 12 research hypotheses.

## 4. Results

Results on motives for seeking ISO 9000 certification, the process and cost of achieving it, the perceived benefits, and the shortcomings of implementation are discussed in this section.

### 4.1 Motives for Seeking ISO 9000 Certification

The rationale of organizations for implementing ISO 9000 comes from different perspectives. In the survey form, respondents were asked to indicate the level of importance of 8 reasons for their decision to seek ISO 9000 implementation using the following scale: 1= unimportant, 2 = not very important, 3 = important, 4 = very important, and 5 = extremely important. As shown in Table 1, since they have the highest median score (4.0), the most important reasons for seeking ISO 9000 certification were the improvement of company image, the improvement of the efficiency of the quality management system, compliance with customer requirements, the improvement of product/service quality, and the improvement of productivity.

With regard to the association between reasons for seeking ISO 9000 certification and organization size or sector type (H1 and H2), as shown in Table 1, the result of the Kruskal-Wallis test at the 0.01 level of significance indicates that there is no evidence to suggest that motives for seeking ISO 9000 certification differ significantly according to organization size or sector type. The finding concerning the organization size is consistent with that of Taylor [2] and contradicts that of Magd and Curry [3] and Magd [4]; whereas the finding concerning the sector type is consistent with that of Magd and Curry [3], and contradicts that of Castka et al. [5] where it is reported that the main motivator for service organizations and manufacturing organizations is different.

Table 1: Motives for seeking ISO certification

		Median	p-value of the Kruskal-Wallis test	
			Comparison by Size	Comparison by type
Motive	Improvement of company image	4	0.69	0.82
	Improvement of the efficiency of the quality system	4	0.50	0.18
	Compliance with customer requirements	4	0.75	0.85
	Meeting government demands	3	0.10	0.41
	Improvement of marketing internationally	3.5	0.13	0.22
	Improvement of product/service quality	4	0.71	0.85
	Improvement of productivity	4	0.65	0.55
	Reduction in costs	3	0.65	0.56

### 4.2 Process and Cost of Achieving ISO Certification

The successful implementation of any process is definitely dependent on the contribution of many factors. In the survey form, respondents were asked to indicate the extent to which each of 11 factors contributed to the successful implementation of ISO 9000 using the following scale: 1 = no contribution, 2 = little contribution, 3 = some

contribution, 4 = considerable contribution, and 5 = crucial contribution. As shown in Table 2, top management commitment was found to be the leading factor that contributed to the successful implementation of ISO 9000. The median score for this factor is 5.0. In addition to the top management commitment, the median score for each of the other listed factors is 4.0. To explore whether or not the contribution of these factors to successful implementation differs significantly according to organization size or sector type (H3 and H4), the Kruskal-Wallis test was conducted. As shown in Table 2, at the 0.01 level of significance, there is no evidence to suggest that the key factors for the successful implementation of ISO 9000 differ significantly according to organization size or sector type.

Table 2: Factors that contribute to the successful implementation of ISO 9000

		Median	p-value of the Kruskal-Wallis test	
			Comparison by size	Comparison by type
Factor	Awareness of employees	4	0.73	0.41
	Involvement of all employees in the implementation process	4	0.49	0.66
	Education and training of employees	4	0.43	0.12
	Education and training of internal auditors	4	0.77	0.73
	Commitment of top management	5	0.95	0.26
	Involvement of top managers in the meetings	4	0.97	0.72
	Inter-department coordination	4	0.51	0.03
	Open and trusting working environment	4	0.24	0.19
	Belief of employees in the importance of quality systems	4	0.60	0.28
	Availability of resources	4	0.32	0.21
	Economical viability	4	0.60	0.48

A major deciding factor for organizations that are planning to invest in ISO 9000 certification is how burdensome it would be to achieve, as well as how significant the pay back of achieving it would be. In this study, this factor was represented by one dependent variable: the perceived benefits versus the cost of implementation. The computed median score for this variable is 4.0. This high score is consistent with the finding of Chittenden et al. [6], where it is reported that the benefits of implementing ISO 9000 outweighed the cost of implementation. According to the Kruskal-Wallis test at the 0.01 level of significance, there is no evidence that the benefits perceived versus the cost of implementing ISO 9001:2000 differs significantly according to organization size or sector type (H5 and H6).

#### 4.3 Perceived Benefits from Implementation

Perceived benefits by organizations in return for investment in ISO 9000 certification have been extensively reported in the literature. In this study, respondents were asked to indicate the extent to which each of 27 benefits had being perceived by implementing ISO 9000 using the following scale: 1 = no benefit, 2 = slight improvement, 3 = good improvement, 4 = high improvement, and 5 = very high improvement. The median scores for these benefits are given in Table 3. According to these scores, the highest improvement was found to be in quality awareness, customer satisfaction, the clarity of work procedures, and documentation systems. As shown in Table 3, according to the Kruskal-Wallis test at the 0.01 level of significance, there is no evidence to suggest that perceived benefits differ significantly according to organization size or sector type (H7 and H8).

#### 4.4 Shortcomings of Implementation

The questionnaire also addressed the issue of shortcomings arising from ISO 9000 implementation. Respondents were asked to indicate the extent to which they agreed with each of seven statements related to the possible shortcomings of implementing ISO 9000 using the following scale: 1 = strongly disagree, 2 = disagree, 3 = slightly agree, 4 = agree, and 5 = strongly agree. As shown in Table 4, none of the possible shortcomings received has a median score of 4 or above, though increased/complex paper work has the highest median score compared to the

others. One interesting point to note is that increased paperwork is most likely due to the improvements that have been made in the documentation system, which was found to be one of the most important perceived benefits from ISO 9000 implementation as mentioned above. The result of the Kruskal-Wallis test as shown in Table 4 indicates that at the 0.01 level of significance, there is no evidence to suggest that the shortcomings of ISO 9000 implementation differ significantly according to organization size or sector type (H9 and H10).

Table 3: Perceived Benefits from the implementation of ISO 9000

		Median	p-value of the Kruskal-Wallis test	
			Comparison by size	Comparison by type
Perceived Benefit	Product/service quality	3	0.82	0.10
	Quality awareness	4	0.89	0.16
	Customer satisfaction	4	0.76	0.16
	Profit	3	0.97	0.29
	Time management	3	0.24	0.27
	Materials/spares procurement time	3	0.95	0.21
	Employees' reduction in workload	2	0.94	0.78
	Safety at work	3	0.69	0.31
	Cost reduction	3	0.94	0.14
	Product/ service demand	3	0.76	0.57
	Creative ideas	3	0.62	0.14
	Work efficiency	3	0.71	0.07
	Staff knowledge and skills	3	0.56	0.06
	Clarity of work procedures	4	0.83	0.07
	Clarity of job responsibilities	3	0.39	0.01
	Documentation systems	4	0.33	0.03
	Coordination between sections/departments	3	0.69	0.16
	Staff motivation	3	0.91	0.24
	Staff salaries	3	0.12	0.66
	Market share	3	0.83	0.24
	Exports	3	0.55	0.41
	Delivery time	3	0.93	0.36
	Supplier relations	3	0.96	0.53
	Inspection methods	3	0.70	0.01
	Inspection time	3	0.54	0.58
	Reduction of defects and waste	3	0.86	0.49
	Productivity	3	0.86	0.58

#### 4.5 Satisfaction

The survey was concluded with a question asking respondents about their satisfaction level with ISO 9000. In this question, respondents were asked to rate their organization's level of satisfaction with ISO 9000 using the following scale: 1 = very dissatisfied, 2 = dissatisfied, 3 = indifferent, 4 = satisfied, and 5 = very satisfied. The median score for the level of satisfaction is 4.0 which indicates that the respondents are very satisfied about their decision to invest in ISO 9000 certification. Most likely, this satisfaction has led 98% of the respondents to indicate (in response to one of the survey questions) that upon expiry, their organizations would be willing to renew the certification. According to the Kruskal-Wallis test, at the 0.01 level of significance, there is no evidence to suggest that the level of satisfaction with ISO 9000 depends on organization size or sector type (H11 and H12).

Table 4: Shortcomings of the implementation of ISO 9000

		Median	p-value of the Kruskal-Wallis test	
			Comparison by Size	Comparison by type
Shortcoming	Increased the complexity of paperwork	3	0.81	0.73
	High costs involved	2	0.41	0.56
	The concentration of staff is directed to the assessment and not to the actual work improvement	2	0.99	0.53
	Inapplicability to work environment	2	0.60	0.66
	It relies on the assessor's interpretation of quality	2	0.46	0.93
	Focus on control of the management system rather than improvement of it	2	0.80	0.85

## 5. Conclusions

To address the research questions of this study, 12 null hypotheses were developed and tested using the Kruskal-Wallis test. The results suggest that there is strong evidence that the motives for ISO 9000 implementation, the process and cost of achieving certification, the perceived benefits and shortcomings are the same regardless of organization size or sector type. One possible explanation for these results is that regardless of their operational differences, all organizations require common management skills, i.e., the ability to plan, organize, coordinate, and control. However, these skills are applied differently depending on the organization size or type. In other words, organization size or sector type may not be an issue in ISO 9000 implementation since organizations are usually managed in a way that suits their size or sector type. If this is not the case, then all or many of the 12 null hypotheses could be rejected.

One general important conclusion that can be drawn from this study is that ISO 9000 can be applied to all business sectors and all sizes of organizations. Therefore, the issue of organization size or sector type should not be a factor in deciding upon certification.

It is worth noting that the findings of this study are constrained by the small sample size. However, this sample represents more than 10% of ISO 9000 certified organizations operating in the Sultanate of Oman.

## Acknowledgements

The authors would like to acknowledge the financial support provided by the College of Engineering at Sultan Qaboos University, Grant No. IG /ENG/ MIED/ 07/01.

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